Some information about this section:
41A Discussion Section meets in 120-59, TuTh 1:30 PM - 3:20 PM
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The instructor for the class is Tian Yang (yangtian@stanford.edu). The person responsible for the ACE program is Dr. Noe Pablo Lozano (noe@stanford.edu). In order to register for Math 41A, you need to get a permission number from him.

Review of pre-calculus

Problem 1. Find the domain of the following functions: $f(x) = \sqrt{x^2 + 1} - \sqrt{x^3 - 2}$, $g(x) = \frac{\sqrt{x^2-9}}{x-3}$, $h(x) = \sqrt{x - 100}$.

Problem 2. Draw the graph of the following functions: $f(x) = \cos(\pi x)$, $g(x) = \cos(|\pi x|)$, $g_2(x) = |\cos(\pi x)|$, $h(x) = \tan(x + \pi)$.
Bonus: draw the graph of $q(x) = \frac{1-\cos^2 x}{\sin x}$.

Problem 3. (LA 1.4): Let $f(x) = x^2$ and $g(x) = \sqrt{x}$. Draw the graph of $f$ and $g$. Then draw the graph of the following functions:
- $f_1(x) = x^2 - 5$
- $f_2(x) = (x + 3)^2 - 1$
- $g_1(x) = 2\sqrt{x + 1} + 3$
- $g_2(x) = |2 - \sqrt{x}|$

Problem 4. Let $f(x) = 1 + x + x^2 + x^3 + x^4$. Find $f^{-1}(5)$ and $f^{-1}(f(4))$.

Problem 5. Given $f(x) = \cos x$ and $g(x) = x^2 + \pi$, find $f \circ g(x)$ and $g \circ f(x)$. Show that $f \circ g(x) \neq g \circ f(x)$.
Write the function $h(x) = \sqrt{x^3 + 2}$ as a composition of two functions. Write $h$ as a composition of three functions.

Problem 6. Trig review: what is $\tan x$, $\cot x$, $\sec x$ and $\csc x$? Domain and range of each function?